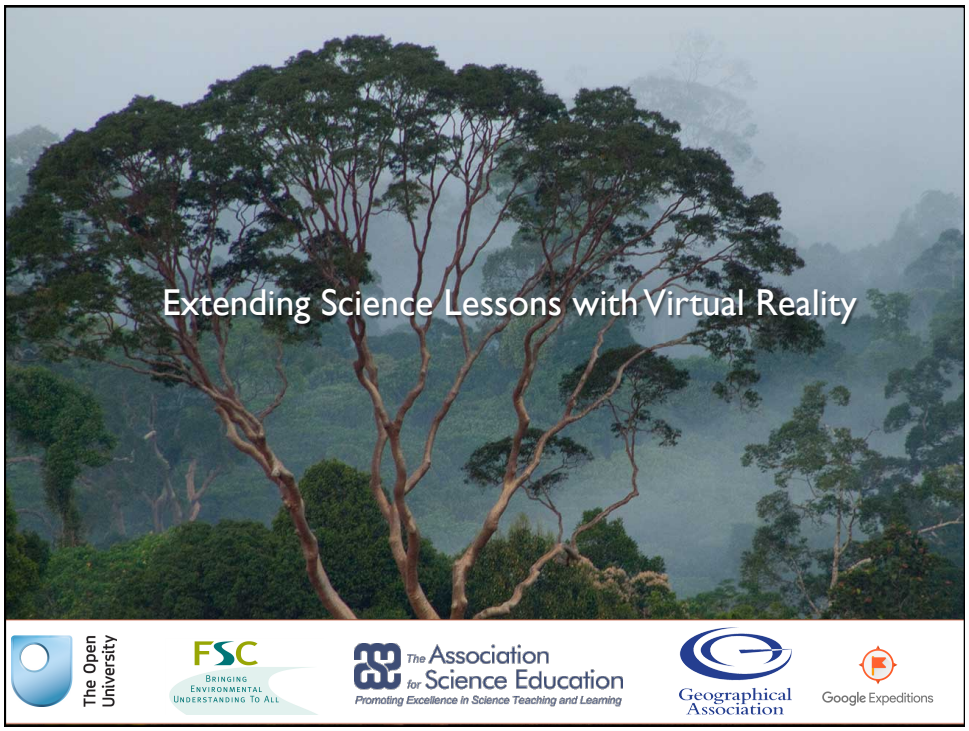
Extending Science lessons with Virtual Reality

Conference or Workshop Item



Extending science lessons with virtual reality

OU: Shailey Minocha, Ana-Despina Tudor

FSC: Steve Tilling and David Morgan

GA: Becky Kitchen and Alan Kinder

ASE: Marianne Cutler and Richard Needham (also at Vicia Learning Solutions Ltd.)

Funded by Google and The Open University, UK

19 November 2016

Agenda

- What is virtual reality?
- Google Expeditions
- Our research goals
- Group discussion
- Preliminary research outcomes

3

What is virtual reality?

A simulated environment on a computer or mobile platform (e.g., smartphone, tablet):

Second Life

Virtual Skiddaw: 3D Geology Field Trips (Unity 3D)

Mobility

4

What is virtual reality?

A simulated environment on a computer or mobile platform (e.g., smartphone, tablet):

Second Life

Virtual Skiddaw: 3D Geology Field Trips

Head-mounted Displays

Viewers

Mobility

5

Google Expeditions

Tablet + Smartphone + Cardboard Viewer + App

6

Google Expeditions

- Photospheres (360° view)
- Three-dimensional representation
- Real places or simulations
- First person exploration

7

Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Science curriculum (classrooms)
- Whether and how virtual reality-based GEs can complement physical field trips
- Whether and how virtual reality can support CPD of teachers
- Recommendations for the user interface design of GEs

8

Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Science curriculum (classrooms)
- Whether and how virtual reality-based GEs can complement physical field trips
- Whether and how virtual reality can support CPD of teachers
- Recommendations for the user interface design of GEs

9

Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Science curriculum (classrooms)
  - Teaching science concepts and phenomena
  - Support inquiry-based learning and students' curiosity

10

How you could help us?

- Trying it out today (Demo)
- Thoughts on the fit with the curriculum

11

Group discussion

Think of one of the difficult concepts in Science:

How could Google Expeditions (or Virtual Reality, in general) help you to teach that concept?

12

Group discussion

How would you use Google Expeditions to encourage inquiry-based learning?

13

Group discussion

What are the challenges that you would face in integrating Google Expeditions in your curriculum?

14

Preliminary research outcomes

Inquiry-based learning activities with students

Lesson Example:

- Learning outcome: How solar energy is converted into electricity
- Teaching resource: "El Romero Solar Photovoltaic Plant"
- Student activity: Write down questions related to the learning outcome

15

Preliminary research outcomes

Inquiry-based learning activities with students

- We analyse the question type

Low-order questions

"How much does a solar power plant cost?"

High-order questions

"What evidence is there to show that [solar energy] is more efficient than burning fossil fuels?"

16

Preliminary research outcomes

Google Expeditions in class:

- More questions than in a usual lesson
- More high-order questions
- More engagement from lower ability students

17

Contact us:

Project website:

http://www.shaileyminocha.info/google-expeditions/

Email addresses:

shailey.minocha@open.ac.uk

ana.tudor@open.ac.uk

Twitter:

@AATudor

@ShaileyMinocha

18